

Assessing methods to index inseason salmon abundance in the lower Copper River

Abstract: The purpose of this three-year project (2001-2003) was to develop and assess methods of monitoring salmon escapement in the lower Copper River. The ultimate goal was to develop an annual monitoring program that could provide fishery managers with more timely indices of salmon escapement than those currently available from the Miles Lake sonar site (river km 52). A multi-faceted research design was developed to (1) significantly shorten the development time of a lower river test fishery; (2) study fish migratory behavior; and (3) compare the utility of acoustics and drift gillnets as test fishing tools. This report presents results from the third year of operation.

Almost continuous acoustic sampling was conducted at Flag Point Channel on the Copper River from 8 May to 6 June 2003. A combination of counting methods (directly from echograms and tracked with acoustic software) and sampling schemes (fully sampled and sub sampled hourly data) were used to generate counts from the acoustic data. A total of 1,902 salmon were counted with a peak of 324 fish on 2 June. There was considerable uncertainty in the 2003 acoustic counts because the frequency distribution of target strengths did not show a clear mode for separating eulachon *Thaleichthys pacificus* from salmon-sized targets. Drift gillnetting was conducted at Flag Point Channel from 6 May to 6 June 2003. A total of 201 sockeye salmon *Oncorhynchus nerka* were captured during 3,077 min of fishing. Daily test fishing indices (fish per 100 fathom hours) for sockeye salmon peaked at 179 on 29 May, and the season cumulative index was 1,109.

Due to anomalously low water levels, acoustic and drift gillnetting methods were unable to effectively index the abundance of early-run salmon in the lower Copper River in 2003 or to track the general trends in abundance observed at the Miles Lake sonar site. Similar to previous years, estimated travel time between Flag Point Channel and the Miles Lake sonar ranged from 1-3 d, with the best model fits produced by estimates of 2-3 d lags. As in 2002, fish appeared to take 1-2 d to travel the 16-km distance between the Copper River ocean fishing district and the Flag Point Channel sample site. Based on the relative strengths and weaknesses of each sampling technique, project investigators recommend acoustics for continued use to index the abundance of salmon in the lower Copper River in 2004.

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